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PROTOZOA

COMPILED BY

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2. PROTOZOA

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FOREWORD

Papers dealing with Protozoa entirely from a medical or veterinary standpoint (clinical, therapeutic, etc.) are omitted, but notices of these will be found in *Tropical Diseases Bulletin* and *Veterinary Bulletin*.

It is regretted that literature dealing with fossil protozoa published in 1957 is not included. This will be included in the next volume.

I.—TITLES

The year of publication has been omitted where it is the same as the volume year of the "Record", namely (1957).

Direction 76. Completion, and, in certain cases, correction of entries relating to the names of genera belonging to the Phyla Protozoa, Coelenterata, Platyhelminthes, Nemathelminthes and Annelida, made on the *Official List of Generic Names in Zoology* by Rulings given in *Opinions* rendered in the period up to the end of 1936. Opin. int. Comm. zool. Nom. **1 E** (14) : 227-264.

Direction 77. Addition to the *Official List of Specific Names in Zoology* (a) of the specific names of thirty-four species belonging to the Phyla Protozoa, Coelenterata, Platyhelminthes, Nemathelminthes, and Annelida, each of which is the type species of a genus, the name of which was placed on the *Official List of Generic Names in Zoology* in the period up to the end of 1936 and (b) of five specific names which are currently treated as senior subjective synonyms of the names of such species. Opin. int. Comm. zool. Nom. **1 E** (15) 1957 : 265-292.

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Cyst-formation. — Encystation of marine protozoa, R. Hirano & Y. Ohshima; Encystment in *Hartmannella*, D. L. Ray; Encystation of *Entamoeba histolytica*, L. Lamy & V. Molinari; Encystation of *Entamoeba*, W. Balamuth; Induced encystation of *Entamoeba*, R. de Blasi & M. L. Ricciardi; Encystment of Radiolaria, A. Hollande & M. Enjumet; Sporulation of coccidia, Z. M. Kogan; Factors affecting the liberation of sporozoites from *Eimeria tenella* oocysts, M. Ikeda (1), (2); Emergence of the sporoplasma in Microsporidia, A. S. Dissanaike & E. U. Canning; Cysts of *Tetrahymena*, D. D. Hurst (2).

Behaviour. — Mating behaviour of *Paramecium*, T. M. Sonneborn (2); Avoiding reaction by *Paramecium*, B. Párduez (1); Effect of fission rate on autogamy in *Paramecium*, B. Gelber (1); Learning in *Paramecium*, B. Gelber (2); D. D. Jensen (1), (2); Peripheral reaction in *Paramecium caudatum*, A. Grebecki, W. Kinastowski & L. Kuznicki.

Cultivation.—Cultivation of marine protozoa, R. Hirano & Y. Ohshima; Axenic cultivation of *Acanthamoeba*, R. J. Neff (1); Method for obtaining clone cultures of soil amoebae, D. Harrison; Cultivation of *Amoeba*, M. Taylor (2); Culture of *Amoeba dubia*, J. A. Dawson (3); Culture of *Amoeba proteus* and *A. dubia*, J. A. Dawson (2); *Pelomyxa* cultured with single protozoan species, R. M. Nardone (1). Preparation of axenic cultures of *Pelomyxa carolinensis*, R. M. Nardone (3). Cultivation of *Pelomyxa palustris*, R. R. Kudo; Growth of *Entamoeba* in cell-free medium, H. D. Baernstein, C. W. Rees & I. L. Bartgis; *Entamoeba* found at surface of cultures, P. Conner, G. Rosenthal and J. G. Shaffer; *Entamoeba* growth in various culture media, L. Capocaccia (2); Absence of growth of *Entamoeba* with *Trichomonas*, H. Baba (1); Cultivation of small race *Entamoeba histolytica* in blood medium, R. M. McQuay; Modified Shaffer-Frye method for growing *Entamoeba histolytica*, R. E. Reeves, H. E. Meleney & W. W. Frye (2); *Entamoeba histolytica* cultured with chick embryo tissue juice, R. E. Reeves, H. E. Meleney & W. W. Frye (1); Bacteria and growth of *Entamoeba*, K. Suzuki (2); Bacterial factors in growth of *Entamoeba*, K. Suzuki (1); Axenic growth of *Entamoeba invadens*, N. R. Stoll; Growth studies of mixed ciliate and flagellate cultures, S. Mučibabić (2); Cultivation of haemoflagellates from insects A. Packchanian (2); Growing *Ochromonas* above 35°C., S. H. Hutner & others; New medium for *Leishmania*, H. Medina & M. Bacila; Axenic cultivation of trichomonads, L. S. Diamond; Cultivation of *Trichomonas*, S. M. Pak; Influence of bacteria on growth of *Trichomonas*, C. Moriguchi (4); Culture of *Trichomonas foetus*, E. Hess; Cultivation of *Trichomonas foetus*, S. A. Azhinov; Culture of *Trichomonas tenax*, I. de Carneri (1); Monaxenic cultivation of *Trichomonas tenax*, B. M. Honigberg, M. Mandel, J. J. Lee & S. D. Braunthal; Cultivation of *Trichomonas vaginalis* with tissue, E. Kotcher & A. C. Hoogasian; Cultivation of *Trichomonas limacis*, J. Lom

(3); Bacteria-free culture of *Trichomonas hominis*, C. Moriguchi (2); Culture of *Plasmodium* in tissue culture, D. N. Zasukhin & S. G. Vasina; Cultivation of plasmodia, A. Spandorf & R. D. Manwell; *In vitro* culture of *Plasmodium relictum* oocysts, G. H. Ball & J. Chao; Prolonged culture of *Toxoplasma* in tissue culture, V. Schuhová; Tissue culture of *Toxoplasma*, M. K. Cook & L. Jacobs; Purine and pyrimidine requirements for culture of *Paramecium multimicronucleatum*, C. A. Miller & W. H. Johnson (1); Axenic culture of *Paramecium trichium*, M. J. Jones, C. P. Keesham & D. M. Lilly; Cultivation of *Balantidium*, K. Urabe (1); Bacteria promoting growth of *Balantidium*, K. Urabe (2); Cultivation of *Nyctotherus* and *Balantidium*, J. Lom (1); Axenic growth of *Styloynchia pustulata*, B. R. Lucchesi & D. M. Lilly; Culture of *Blepharisma undulans* and *Stentor coerulescens*, J. A. Dawson (1).

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Rhizopoda.—*Amoeba* to flagellate change of *Tetramitus rostratus* induced by nitrogen mustard, M. M. Brent; Development of *proteus* group amoebae, M. Taylor, C. Hayes & M. Galbraith; Life history of *Amoeba*, M. Taylor (2); Development of *Amoeba proteus*, M. Taylor (1); Development of *Rotaliella*, K. G. Grell.

Mastigophora.—Development of *Oodinium*, H. H. Reichenback-Klinke (1); Development of *Astasia cyclopis* sp. n. from free-living to parasitic forms, W. Michajlow; Development of *Leptomonas serpens*, A. J. Gibbs; Development of blood forms of mammalian trypanosomes, E. Reichenow; Polymorphism in *Trypanosoma*, D. J. B. Wijers; Transformation of *Trypanosoma mega* from crithidia to trypanosomes *in vitro*, M. Steinert; Tissue forms of *Trypanosoma cruzi*, S. F. de M. Régo; Development of *Trypanosoma cruzi* *in vitro*, F. Pick; Development of the blood form of *Trypanosoma rangeli*, E. Reichenow; Life cycle of *Trypanosoma nabiasi*, M. S. Grewal (4);

Development of *Trypanosoma garnhami* sp. n., M. S. Grewal (5); Polymorphism in *Trypanosoma brucei* and *T. rhodesiense*, M. T. Ashcroft; Sexual development in *Trichonympha*, L. R. Cleveland (1); Life cycle of *Opalina*, H. Wessenberg.

Sporozoa.—Life cycle of *Eimeria adenoeides*, M. J. Clarkson; Intracellular development of *Eimeria alabamensis*, L. R. Davis, G. W. Bowman & D. C. Boughton; Life cycle of *Eimeria tenella*, B. S. Gill & H. N. Ray (2); Life cycle of *Eimeria gadi*, T. R. Wilson; Development of *Plasmodium*, R. S. Bray (7); Pre-erythrocytic development of *Plasmodium*, P. C. C. Garnham, R. Lainson & W. Cooper (2); Development of *Plasmodium cynomolgi*, R. S. Bray (5); Pre-erythrocytic development of *Plasmodium knowlesi*, P. C. C. Garnham, R. Lainson & W. Cooper (1); Development of *Leucocytozoon simondi* in ducks, A. M. Fallis, G. F. Bennett & R. C. Ritchie; Life cycle of *Plistophora*, E. U. Canning (1); Life cycle of *Nosema helminthorum*, A. S. Dissanaike (2); Development of Actinomyxidia, J. Janiszewska (2).

Ciliophora.—Conjugation in *Paramecium polycaryum*, W. F. Diller; Life history of *Colpoda cucullus*, T. Carter; Hemixis in *Lionotus*, P. N. Ganapati & M. V. Narasimha Rao; Development of oral primordium of *Stentor coeruleus*, V. Tartar (3); Conjugation of *Vorticella*, E. Mügge; Development of suctoria, J. Kormos & J. Kormos; Determination of the site of bud formation in the Suctoria, J. Kormos & K. Kormos (1), (2); Development of *Thecacinetia*, D. Matthes.

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Evolution; Phylogeny.—Phylogeny of protozoa, S. Moshkovski; Cellular versus acellular nature of Protozoa, J. O. Corliss, etc.; Sub-microscopic morphology in classification of amoebae, C.-A. Baud & J.-C. Morard; Origin of akinetoplastic trypanosomes, S. Inoki; Affinities amongst Trichomonadida, B. M. Honigberg

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Variation.—Intraspecific variation in Protozoa, G. I. Poljansky; Intraspecific variation in parasitic protozoa, R. D. Manwell (2); Morphological variation in a living miliolid foraminifera, Z. M. Arnold (2); Variation in size and shape of *Eimeria* oocysts, E. M. Cheissin; Antigenic variation of *Paramecium*, G. H. Beale & H. Kacser; Diurnal change in mating type of *Paramecium*, T. M. Sonneborn (4); Variation in numbers of micronuclei in *Paramecium caudatum*, K. Watanabe; New variety of *Paramecium aurelia*, T. M. Sonneborn (3); Antigenic variation in *Paramecium aurelia*, G. H. Beale (1); Variation in *Entodinium*, G. Lubinsky (1).

Heredity.—Genetics of protozoa, J. R. Preer (2); Multiple strand crossing over in *Chlamydomonas reinhardtii*, W. T. Ebersold & R. P. Levine; R. P. Levine & W. T. Ebersold; Genetics of *Paramecium*, D. G. Catchside; Inheritance of Kappa in *Paramecium*, J. Huxley; Antigenic relationships between cytoplasmic particles in *Paramecium*, R. W. Siegel & J. R. Preer Jr.; Immobilization antigens of *Paramecium aurelia*, I. Finger (1); Ciliary antigen inheritance in variety 2 of

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Biometry.—Study of the size of microsporidian spores, Z. A. Filatova.

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Marine.—Succession of marine fouling organisms, A. A. Aleem; Marine Protozoa of Dale Fort, with geographical and meteorological notes, R. Bassindale & J. H. Barrett; Biocoenoses on sea bottoms with Zosteraceae, P. Parenzan; Phytoplankton of Danish marine inlets, J. Grøntved & E. S. Nielsen; Pelagic microplankton in the west Mediterranean, J. Lecal (2); Fluctuations in numbers of dinoflagellates in California, W. R. Coe; Observations on dinoflagellate blooms, L. R. Pomeroy; H. H. Haskin & R. A. Ragotzkie, Dynamics of a dinoflagellate bloom, R. A. Ragotzkie & L. R. Pomeroy.

Freshwater.—Study of fresh-water protozoan fauna, B. W. McCashland; Basic requirements of an aquatic existence, H. G. S. Wright (2); Vertical migration of plankton producing red tide, Y. Yoneda & Y. Yoshida; Plankton population and pollution of a cut-off branch of the River Waal, P. Leentvaar; Succession of protozoa in bamboo in presence of mosquito larvae, Y. Kurihara (1); Succession of protozoa in bamboo in presence of Diptera larvae, Y. Kurihara (2); Ecology of Suctorria, M. F. Canella.

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[Protozoa in relation to Disease—see under **Economics**.]

PARASITISM.—HOSTS.

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Apodemus sylvaticus (Sicily): *Sarcosporidia*, H. E. Krampitz.

Atherurus africanus centralis, blood (Belgian Congo); *Plasmodium atheruri* sp. n. (Haemosporid.), L. van den Berghe, E. Peel, M. Chardome & F. L. Lambrecht (2).

Bos bubalis, intestine (Egypt); *Entamoeba bubalis* sp. n., M. H. Haiba.

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Bubulas bubalas, caecum (W. Pakistan); *Buxtonella sulcata* (Holotrich), G. Lubinsky (4).

Calves, intestine (Bulgaria), *Trichomonas bovis* sp. n. (Mastig.), P. Pavlov & S. Dimitrov.

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Cattle (China); *Besnoitia besnoiti* (Sporoz.), L. Er-hsiang.

Cattle (Turkey): list of *Eimeria* observed, K. Göksu.

Chimpanzee, blood: *Plasmodium reichenow*, R. S. Bray (4).

Citellus variegatus utah, intestine (U.S.A.); *Isospora citelli* sp. n., N. D. Levine, V. Ivens & F. J. Kruidenier (2).

Cow, blood (Rumania): *Cytuecetes bovis* sp. n., A. C. Oprescu.

Cricetomys dissimilis, intestine (Belgian Congo): *Eimeria schoutedeni* (Coccid.), L. van den Berghe & M. Chardome.

Didelphys marsupialis, kidney (Venezuela): *Klossiella tejerai* sp. n., J. V. Scorza, J. F. Torrealba & C. Dagert.

Didelphys marsupialis aurita, blood (Brazil): *Trypanosoma cruzi*, A. F. Siqueira, A. E. A. Magalhaes & S. F. M. Régo.

Didelphys paraguayensis, blood (Brazil): *Trypanosoma cruzi* (Mastig.), L. M. Deane & M. P. Deane.

Didelphys paraguayensis, blood (Brazil): *Trypanosoma freitasi* sp. n. (Mastig.), S. F. M. Régo, A. E. A. Magalhaes & A. F. Siqueira.

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Dogs (Yugoslavia): *Toxoplasma* (Sporoz.), B. Maržan & T. Wickerhauser.

Dogs (Japan): *Toxoplasma* and intestinal protozoa, H. Matsumoto (1).

Dog, intestine (India): *Entamoeba histolytica* (Rhizop.), M. S. Ganapathy & V. S. Alwar.

Dog (U.S.A.): leishmaniasis in an imported animal, C. A. Gleiser, J. Thiel & I. G. Cashell.

Helogale undulata rufula, blood (Kenya), *Babesia heischi* and *B. hoarei* (Haemosporid.), M. S. Grewal (1), (2).

Heterocephalus glaber (Kenya): description of protozoa observed, A. Porter.

Jaculus sp., blood (Egypt), *Hepatozoon balfouri*, H. Hoogstraal.

Microtus agrestis, blood (Czechoslovakia): *Hepatozoon microti* (Greg.), *Grahamnella*, Z. Černa (2).

Miniopterus schreibersi, blood (Sicily): *Polychromophilus melaniferus* (Haemospor.), H. E. Krampitz.

Mus musculus (Sicily): *Sarcosporidia*, *Trypanosoma duttoni* (Mastig.), H. E. Krampitz.

Mustela furo (England): *Toxoplasma*, R. Lainson.

Mustela nivalis (England): *Toxoplasma*, R. Lainson.

Perameles nasuta (Australia): *Toxoplasma*, J. H. Pope, V. A. Bicks & I. Cook.

Perodicticus potto ibeanus, blood (Belgian Congo): *Trypanosoma* sp., L. van den Berghe, M. Chardome & E. Peel (4).

Perodicticus potto ibeanus, blood (Belgian Congo); *Theileria perodictici* (Haemosporid.), L. van den Berghe, E. Peel & M. Chardome (3).

Perodicticus potto ibeanus, blood (Belgian Congo); *Trypanosoma iraniense* sp. n. (Mastig.), L. van den Berghe, E. Peel & M. Chardome (4).

Phascolomys ursinus, gut (Vienna, Zoological Gardens): *Eimeria tasmaniæ* sp. n. & *E. ursini* sp. n., R. Supperer.

Pipistrellus kuhli, blood (Sicily): *Trypanosoma vespertilionis* (Mastig.) H. E. Krampitz.

Pitymys savii, blood (Sicily): *Hepatozoon pitymysi* (Coccid.), H. E. Krampitz.

Polecat-ferret hybrid (England): *Toxoplasma*, R. Lainson.

Rattus assimilis (Australia): *Toxoplasma*, J. H. Pope, V. A. Bicks & I. Cook.

Rattus norvegicus, (England): *Toxoplasma*, R. Lainson.

Rattus norvegicus blood (Sicily): *Hepatozoon muris* (Coccid.), H. E. Krampitz.

Rattus norvegicus (Australia): *Toxoplasma*, J. H. Pope, V. A. Bicks & I. Cook.

Rattus rattus (Sicily): *Trypanosoma lewisi* (Mastig.), *Sarcosporidia* (Sporoz.), H. E. Krampitz.

Rodents (Czechoslovakia); coccidia observed, B. Ryšavý (2).

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Sorex araneus, blood (Czechoslovakia); *Grahamella soricis*, sp. n., M. Přívora.

Sorex araneus, blood (Czechoslovakia): *Grahamella*, Z. Černa (2).

Sorex minutus, blood (Czechoslovakia): *Hepatozoon microti* (Greg.), Z. Černa (2).

Squirrels, intestine (Yugoslavia); *Eimeria serbica* sp. n., S. Pop-Cenitch & A. Bordjochki.

Sylvilagus floridanus mearnsi, intestine (U.S.A.): *Eimeria* sp. (Coccid.), D. H. Ecke & R. E. Yeatter.

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Tadarida brasiliensis mexicana, blood (U.S.A.), unknown blood parasite, E. Lesser, K. F. Burns & C. J. Farinacci.

Talpa europea, gut (Italy): *Isospora talpae* sp. n., I. ricci, *Cyclospora caryolytica* (Coccid.), G. Agostinucci.

Taurotragus onyx patterssonianus, blood (Kenya); *Theileria mutans*, L. van den Berghe.

Thylacis obesulus (Australia): *Toxoplasma*, J. H. Pope, E. H. Derrick & I. Cook; J. H. Pope, V. A. Bicks & I. Cook.

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Atoxoplasma and *Toxoplasma* of birds, D. M. Zasukhin, S. G. Vasina & P. B. Levitanskaya.

Canaries: *Plasmodium cathemerium* (Haemosporid.), W. J. Mathey (2).

Corvus splendens, blood (Pakistan):
Babesia moszkovskii, M. Laird &
 F. A. Lari.

Fowl, blood (India): *Leucocytozoon* (Haemosporid.), G. R. Ramaswami.

Francolinus erckeli, intestine (Italy): *Histomonas meleagrididis* (Mastig.), I. Giavarini.

Francolinus sp., blood (India): *Leucocytozoon* sp. (Haemosporid.), B. S. Gill & H. N. Ray (1).

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Magpie, blood (U.S.A.): incidence of blood parasites, A. F. Hagen.

Passer domesticus domesticus, blood (U.S.A.), blood parasites, R. D. Manwell (1).

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Pigeons: *Plasmodium relictum* (Haemosporid.), W. J. Mathey (1).

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Spinus spinus (U.S.S.R.); *Atoxoplasma* sp. (Sporoz.), D. Sassuchin, S. Wassina & P. Levitanskaja.

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Ameiva ameiva ameiva, blood (Venezuela); *Plasmodium pifanoi*, sp. n. (Haemosporid.), J. V. Scorza & C. Dagert B. (2).

Anolis sp., blood (Venezuela); *Plasmodium torrealbi* sp. n. (Haemosporid.), J. V. Scorza & C. Dagert B. (1).

Coluber karolini, blood (India), haemogregarine, G. H. Ball (2).

Lacerta agilis, intestine (Czechoslovakia): *Trichomonas augusta* (Mastig.), J. Kulda.

Lacerta vivipara, intestine (Czechoslovakia): *Trichomonas augusta* (Mastig.), J. Kulda.

Mochlus fernandi, blood (Belgian Congo): *Trypanosoma mochli* sp. n. (Mastig.), L. van den Berghe, M. Chardome & E. Peel (5).

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Ciliates found in Amphibia in Bucarest, I. Căpușe & D. Dancău.

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Bufo regularis, blood (French Congo): *Haemogregarina lavieri* (Coccid.), O. Tuzet & A. Grjebine.

Rana tigrina, rectum (India); *Opalina scalpriformis* (Mastig.), C. Bal & P. V. Ranjini.

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Parasitic protozoa of fish, O. N. Bauer.

Fish (Russia): parasitic protozoa, E. S. Kudryavtzeva, E. S.

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Fish from Czechoslovakia, blood; *Trypanoplasma* (Mastig.), Z. Lucký.

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Bibio larvae, intestine (Bavaria); *Scheideria mucronata*, *Nosema bibionis* sp. n., *Duboscqia bibionidarum* sp. n., *D. philiae* sp. n., *Plistophora enterobia* sp. n., *P. amasiae* sp. n., H. J. Stammer (1).

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Chiroscutis digitata, gut (Belgian Congo); *Nyctotherus obesus* (Cil.), O. Tuzet & J. Théodoridès (2).

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Lymantria dispar (Czechoslovakia); *Nosema lymentriae*, *N. muscularis* (Microsporid.), J. Weiser.

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B. ZOOMASTIGINA

(g) **Trichomonadida.**

Systematics of the Trichomonadida, B. M. Honigberg (2).

Trichomonas bovis sp. n. (p. 243) from Bulgarian calves, P. Pavlov; *T. bovis* sp. n. (p. 295) from calves (Bulgaria), P. Pavlov & S. Dimitrov.

(h) **Hypermastigida.**

Holomastigoloides truncata, sp. n. (p. 281), from termite, N. Narain (1); *H. rostrata* sp. n. (p. 281) from termite, N. Narain (2).

(i) **Diplomonadida.**

[No record.]

(j) **Polymonadida.**

[No record.]

(k) **Opalinida.**

Cepedea dracuncula sp. n. (p. 577), *C. dimidiata saigonensis* sub. sp. n. (p. 582) from Viet-Nam amphibia, R. Boisson (2).

Opalina tigrina sp. n. (p. 578), *O. cancrivora* sp. n. (p. 580), *O. cristulata* sp. n. (p. 583) from Viet-Nam amphibia, R. Boisson (2).

Protopalina stevensoni saigonensis sub. sp. n. (p. 579) from Viet-Nam amphibia, R. Boisson (2).

3.—SPOROZOA

A. COCCIDIOMORPHA

(a) **Gregarinida.**

Actinocephalus kintaikyoensis sp. n. (p. 174) from Japanese stone fly larva, H. Hoside (3).

Craterocystis myonemata sp. n. (p. 74) from oligochaete, Indo-China, C. Boisson (1).

Dinematospora grassei, gen. n., sp. n. (p. 344) from Thysanuran insect, O. Tuzet.

Dirhynchocystis sacciformis sp. n. (p. 78), from oligochaete, Indo-China, C. Boisson (1).

Garnhamia aciculata gen. n. (p. 91) from Ceylonese insect, H. Crusz.

Gregarina diestrammenae sp. n. (p. 69) from Japanese insect, H. Hoside (1); *G. monoducta* sp. n. (p. 168) from Japanese insect, H. Hoside (2).

Monocystis minima sp. n. (p. 72), *M. minor* sp. n. (p. 75), *M. minor saigonensis* sub. sp. n. (p. 79), *M. longispora* sp. n. (p. 82), *M. nidata* sp. n. (p. 83), *M. radiata* sp. n. (p. 84), *M. biacuminata* sp. n. (p. 86) from oligochaetes, Indo-China, C. Boisson (1).

Nematocystis glossoscoli sp. n. (p. 87) from oligochaete, Indo-China, C. Boisson (1).

Pileocephalus hydropsychus sp. n. (p. 173) from Japanese insect, H. Hoside (3).

Stenophora jeekeli sp. n. (p. 64), *S. congoi* sp. n. (p. 65), *S. prionopetali* sp. n. (p. 69), *S. haplophysani* sp. n. (p. 72) from myriapods caught in Belgian Congo, O. Tuzet, J. F. Manier, P. Jolivet (2); *S. xenoboli* sp. n. (p. 165), from millipede, P. N. Ganapati & C. C. Narasimhamurti.

(b) **Coccidiida.**

Classification of coccidia, C. A. Hoare (5).

Homonymy of *Eimeria fulva* Farr 1953 and *Eimeria fulva* 1954, L. Pellérdy.

Eimeria bohemica sp. n. (p. 332) from Czech rodent, B. Ryšavý; *E. falciformis* type species of genus, Direction 77; *E. mundanagi* sp. n. (p. 355) from calf, L. S. Hriegandar (1); *E. parasciurorum* sp. n. (p. 229) from American squirrel, B. B. Bond & E. C. Bovee; *E. rissae* sp. n. (p. 1057) from Welsh kittiwake, E. J. L. Soulsby & A. R. Jennings; *E. schoutedeni* sp. n. (p. 2) from African rat, L. van den Berghe & M. Chardome; *E. serbica* sp. n. (p. 75) from Yugoslav squirrels, S. PoppenCenitch & A. Bordjochki; *E. sporadica* sp. n. (p. 283) from Russian poultry, O. Plaan; *E. tamiasciuri* sp. n. (p. 80), *E. lateralis* sp. n. (p. 81), *E. entamiae* sp. n. (p. 82), *E. thomomysis* sp. n. (p. 83), *E. perognathi* sp. n. (p. 83), *E. albigulae* sp. n. (p. 84), *E. operculata* sp. n. (p. 84), *E. peromysci* sp. n. (p. 85), *E. arizonensis* sp. n. (p. 86), *E. ereumici* sp. n. (p. 86), *E. onychochomysis* sp. n. (p. 87), from rodents, N. D. Levine, V. Ivens & F. J. Kruidenier (1); *E. (Globidium) tasmaniae*, sp. n. (p. 510), *E. (Eimeria) ursini* sp. n. (p. 512) from captive wombat, R. Supperer.

Isospora citelli sp. n. (p. 143) from American rodent, N. D. Levine, V. Ivens & F. J. Kruidenier (2); *I. talpae* sp. n. (p. 406), *I. riccii* sp. n. (p. 407) from Italian moles, G. Agostinucci.

Klossiella tejerai sp. n. (p. 102), from Venezuelan marsupial, J. V. Scorza, J. F. Torrealba & C. Dagert.

(c) Haemosporidia.

Babesia (Babesiella) heischi sp. n. (p. 152), *B. (Babesia) hoarei* sp. n. (p. 154) from African mongoose, M. S. Grewal (1); *B. (Babesiella) heishi* sp. n. from African mongoose, M. S. Grewal (2); *B. (Babesia) hoarei* sp. n. from African mongoose, M. S. Grewal (2); Systematic position of *B. moshkovskii*, M. Laird & F. A. Lari; *B. perodictici* sp. n. (p. 87) substituted for *Theileria perodictici*, L. van den Berghe, E. Peel & M. Chardome (2).

Gonderia bovis sp. n. (p. 382) from African cattle, W. O. Neitz (2).

Specific classification of *Plasmodium*, R. S. Bray (7).

Plasmodium atheruri sp. n. (p. 17) from African pig, L. van den Berghe, E. Peel, M. Chardome & F. L. Lambrecht (2); *P. pifanoi* sp. n. (p. 4) from Venezuelan reptile, J. V. Scorza & C. Dagert B. (2); *P. torrealbi* sp. n. (p. 114) from Venezuelan reptile, J. V. Scorza & C. Dagert B. (1).

Theileria perodictici sp. n. (p. 16) from African lemur, L. van den Berghe, E. Peel & M. Chardome (3).

B. CNIDOSPORIDIA

(d) Myxosporidia.

Ceratomyxa anguillae sp. n. (p. 195) from eel, O. Tuzet & R. Ormieres.

Chloromyxum majori sp. n. (p. 634) from Pacific salmonids, W. T. Yasutake & E. M. Wood.

Myxidium minteri sp. n. (p. 633) from Pacific salmonids, W. T. Yasutake & E. M. Wood.

Myxobolus kisutchi sp. n. (p. 635) from Pacific salmonids, W. T. Yasutake & E. M. Wood; *M. magellanicus* sp. n. (p. 13), *M. galaxii* sp. n. (p. 12) from Argentine fish, L. Szidat.

Thelohanellus cyprini sp. n. (p. 72) from Japanese carp, T. Hoshina & S. Hosoda.

(e) Microsporidia.

Taxonomic position of microsporidian from *Antheraea*, Z. A. Filatova.

Duboscqia bibionidarum sp. n. (p. 353), *D. philiae* from bibionid larvae, H. J. Stammer (1).

Glugea artemiae sp. n. (p. 562) from crustacean, Rumania, R. Codreanu.

Gurleya dispersa sp. n. (p. 564) from crustacean, Rumania, R. Codreanu.

Nosema aporivora sp. n. (p. 187) from Czech caterpillars, J. Veber (1); *N. bibionis* sp. n. (p. 352) from bibionid larvae, H. J. Stammer (1); *N. exigua* sp. n. (p. 561) from crustacean, Rumania, R. Codreanu;

Nomenclature of *N. helminthorum*, A. S. **Dissanaike** (1); *N. lymantriae* sp. n. (p. 67); *N. muscularis* sp. n. (p. 71) from Czech insects, J. **Weiser**.

Plistophora enterobia sp. n. (p. 353), *P. amasiae* from bibionid larvae, H. J. **Stammer** (1); *P. pandemis* sp. n. (p. 191) from Czech caterpillars, J. **Veber** (2).

Thelohania simitis, sp. n. (p. 75) from Czech insects, J. **Weiser**.

(f) Actinomyxidia.

Generic differences in Actinomyxidia, J. **Janiszewska** (1).

Aurantiactinomyxon raabei iunioris gen. n., sp. n. (p. 26), from Polish oligochaete, J. **Janiszewska** (2).

Echinactinomyxon radiatum gen. n., sp. n. (p. 28), from Polish oligochaete, J. **Janiszewska** (2).

Hexactinomyxon hedvigii sp. n. (p. 32) from Polish oligochaete, J. **Janiszewska** (2).

Raabeia magna sp. n. (p. 24) from Polish oligochaete, J. **Janiszewska** (2).

(g) Sarcosporidia.

Sarcocystis, type species to be *S. miescherianum*, Direction 76, Direction 77; *S. cervi* sp. n. (p. 224) from deer, Vietnam, P. **Destombes**; *S. didelphis* sp. n. (p. 104) from Venezuelan marsupial, J. V. **Scorza**, J. F. **Torrealba** & C. **Dagert**.

(h) Haplosporidia.

[No records.]

SPOROZOA INCERTAE SEDIS

[No records.]

4.—CILIOPHORA

Nomenclature of the higher taxa in Ciliophora, J. O. **Corliss** (2) (5).

A. CILIATA

The species problem in ciliate protozoa, T. M. **Sonneborn** (1).

(a) Holotrichida.

Chattonia lenticularis gen. n., sp. n. (p. 105), ciliate from crustacean, P. **Debaudieux**.

Cochliophilus oncomelaniae sp. n. (p. 350) from Chinese mollusc, T. **Tchang**, C. **Tang** & S. **Wang**.

Revised classification of the hoplotothryid ciliates, *Georgevitchiella* gen. n. (p. 106), P. de **Puytorac** (4).

Jirovecella hegemonis, gen. n., sp. n. (p. 229), from oligochaete, J. **Lom** (4).

Systematic significance of buccal organelles in *Paramecium*, A. **Yusa**.

New variety of *Paramecium aurelia*, T. M. **Sonneborn** (3).

Radiophrya grandis sp. n. (p. 1287) from Russian oligochaete, E. N. **Frolova**.

Schizocaryum dogieli gen. n., sp. n. (p. 138), G. **Poljansky** & M. **Golikowa** (1). *S. dogieli* gen. n., sp. n. (p. 138), G. **Poljansky** & M. **Golikowa** (2).

Tetrahymena paravorax sp. nov. (p. 13), J. O. **Corliss** (3).

Trachelocerca dogieli sp. n. (p. 359), I. B. **Raikov**.

Trichopelma agilis sp. n. (p. 276) from France, A. **Savoie**.

Trichopus lachmanni sp. n. (p. 145) from France, E. **Fauré-Fremiet** (4).

(b) Heterotrichida.

Balantidium rotundum minor sub. sp. n. (p. 575), *B. rotundum major* sub. sp. n. (p. 575), *B. helenae saigonensis* sub. sp. n. (p. 575), from Viet-Nam amphibia, C. **Boisson** (2).

Bursaria, selection of type species, Direction 76, Direction 77.

Cepedea gracilis minor subsp. n. (p. 143) from Rumanian frog, I. **Căpușe** & D. **Dancău**.

Nyctotherus congoi sp. n. (p. 16) from myriapod, O. **Tuzet**, J. F. **Manier** & P. **Jolivet** (1); *N. hoyoi* sp. n. (p. 11), *N. congoi* sp. n. (p. 16), from myriapods from Belgian Congo, O. **Tuzet** & J. **Théodoridès** (1); *N. obesus* sp. n. (p. 77) from Belgian Congo insect, O. **Tuzet** & J.

Théodoridès (2); *N. pangasia* sp. n. (p. 224) from Indian fish, Y. R. Tripathi; *N. pyriformis* (p. 68) from crickets, M. Chakravarty & T. P. Chatterjee; *N. vesiculatus* sp. n. (p. 575) from amphibia, Viet Nam, C. Boisson (2).

(c) Oligotrichida.

Entodinium simulans caudatum sp. n., forma n. (p. 121), *lobosa-spinosum* forma n. (p. 123), *dubardi* forma n. (p. 124) from rumen contents, G. Lubinsky (1).

Classification of genera of Ophryoscolecidae, G. Lubinsky (3).

(d) Entodiniomorpha.

Entodinium anteronucleatum forma minus forma n. (p. 804) from ibex, C. Noirot-Timothée & M. A. J. Couturier.

Eudiplodinium neglectum forma *ibicis* forma n. (p. 805) from ibex, C. Noirot-Timothée & M. A. J. Couturier.

(e) Hypotrichida.

Euplates leticiensis sp. n. (p. 125) from Amazon, E. C. Bovee (4).

(f) Peritrichida.

Trichodina alburni sp. n. (p. 175) from fish, J. Vojtek; *T. indica* sp. n. (p. 225) from Indian fish, Y. R. Tripathi.

Glossatella cyprini sp. n. (p. 37) epizoic on *Cyprinus*, R. Srámek-Hušek (2).

Rhabdostyla cyprini sp. n. (p. 40) epizoic on *Cyprinus*, R. Srámek-Hušek (2).

Scyphidia pyriformis sp. n. (p. 227) from Indian fish, Y. R. Tripathi.

B. SUCTORIA

Systematics of Suctoria, M. F. Canella.

PROTISTA INCERTAE SEDIS

Cytaecetes bovis sp. n. (p. 1085) from Rumanian cow, A. C. Oprescu.

Grahamella soricis sp. n. (p. 265) from Czech shrew, M. Přívora.

Karyonella cristata gen. n., sp. n. (p. 449), from blood of guinea-fowl, D. J. Cabrera.

